

## IN THE CLAIMS

Please amend the claims as follows:

1. (currently amended) A system for scheduling a data transfer over a communication network, comprising:

a node configured to send data;

a node configured to receive data; and

a transfer module at each node, the transfer module comprising a scheduling module, the scheduling module comprising a feasibility test configured to determine whether a single hop request is feasible, the transfer module configured to evaluate a data transfer request in view of satisfying objectives in accordance with resources at each node.

2. (currently amended) The system of claim 1, wherein the resources at each node comprise ~~include~~ transmit bandwidth.

3. (currently amended) The system of claim 1, wherein the resources at each node comprise ~~include~~ receive bandwidth.

4. (currently amended) The system of claim 1, wherein the resources at each node comprise ~~include~~ storage space.

5. (original) The system of claim 1, wherein the resources at each node vary as a function of time.

6. (currently amended) The system of claim 1, wherein the objectives comprise ~~include~~ a deadline for the delivery of the requested data to the node configured to receive data.

7. (currently amended) The system of claim 1, wherein the objectives comprise ~~include~~ minimizing the cost of delivery of data to the node configured to receive data.
8. (original) The system of claim 1, wherein the transfer module evaluates the data transfer request in view of available transmit bandwidth at the node configured to send data, and available receive bandwidth at the node configured to receive the data.
9. (original) The system of claim 1, wherein the transfer module located at the node configured to receive data transmits a message indicating available receive bandwidth to the transfer module located at the node configured to send data.
10. (original) The system of claim 1, further comprising a node configured to send data and to receive data.
11. (currently amended) The system of claim 1, wherein the transfer module comprises ~~includes~~ an admission control module configured to accept or deny a data transfer request from a user.
12. (currently amended) The system of claim 11, wherein the admission control module comprises ~~includes~~ a soft rejection routine.
13. (original) The system of claim 12, wherein the soft rejection routine suggests a different deadline for a denied data transfer request from the user.
14. (original) The system of claim 12, wherein the soft rejection routine is configured to offer to place a denied data transfer request on a waiting list.
15. (cancelled)

16. (currently amended) The system of claim [[15]] 1, wherein the scheduling module is configured to generate a single hop request that comprises ~~includes~~ the identity of the data, available resources at that node, and a deadline for delivery.

17. (currently amended) The system of claim [[15]] 1, wherein the scheduling module is configured to evaluate a single hop request that comprises ~~includes~~ the identity of requested data and a deadline for delivery, and to respond to the single hop request with a denial or an acceptance.

18. (currently amended) The system of claim [[15]] 1, wherein the scheduling module further comprises ~~includes~~ a preemption module configured to preempt scheduled transfers for transfers having a higher priority.

19. (cancelled)

20. (currently amended) The system of claim [[15]] 1, wherein the scheduling module comprises ~~includes~~ an explicit scheduling routine configured to determine if an explicit schedule for a single hop data transfer can be made.

21. (currently amended) The system of claim 1, wherein the transfer module comprises ~~includes~~ a routing module configured to identify possible sources of requested data.

22. (original) The system of claim 1, wherein the routing modules identifies possible sources of requested data using proxy lists.

23. (currently amended) The system of claim 1, wherein the transfer module further comprises ~~includes~~ an execution module configured to execute scheduled data transfers.

24. (original) The system of claim 23, wherein the execution module executes scheduled data transfers ahead of schedule using a dynamic request protocol.

25. (original) The system of claim 23, wherein the execution module executes scheduled data transfers such that the scheduled data transfers are completed by their deadlines.

26. (original) The system of claim 23, wherein the execution module uses available bandwidth at nodes in the network to execute data transfers ahead of schedule.

27. (currently amended) The system of claim 1, wherein the transfer module comprises ~~includes~~ a slack module configured to determine an amount of reserved resources for a node.

28. (currently amended) The system of claim 1, wherein the transfer module comprises ~~includes~~ a padding module configured to determine an amount of time to add to time required for completion of a data transfer.

29. (currently amended) The system of claim 1, wherein the transfer module further comprises ~~includes~~ a priority module configured to assign a priority to the data transfer request.

30. (currently amended) The system of claim 1, wherein the transfer module further comprises ~~includes~~ an error recovery module configured to maintain a current state of the transfer module to allow a node to be restarted.

31. (currently amended) The system of claim 1, wherein the data transfer request comprises ~~includes~~ an earliest deadline for arrival of the data at the node configured to receive data, a latest deadline for arrival of the data at the node configured to receive data, and a minimum time available during which the data remains available to a user at the node configured to receive data.

32. (currently amended) ~~The system of claim 1,~~ A system for scheduling a data transfer over a communication network, comprising:

a node configured to send data;

a node configured to receive data; and

a transfer module at each node, the transfer module comprising a routing module configured to identify possible source nodes for the data, the transfer module configured to evaluate a data transfer request in view of satisfying objectives in accordance with resources at each node, wherein the transfer module at the node configured to receive data ~~includes~~ further comprises an admission control module configured to accept or deny a data transfer request from a user, wherein the admission control module sends a scheduling request to a scheduling module, the scheduling request comprising an identification of the data and a deadline and wherein the scheduling module at each possible source node identified by the routing module evaluates a single hop request from the scheduling module of the node configured to receive data and the scheduling module at at least one of the possible source nodes evaluates the single hop request using a feasibility test.

33-36. (cancelled)

37. (currently amended) The system of claim ~~[[35]]~~ 32, wherein the scheduling module at one of the possible source nodes evaluates the single hop request by attempting to determine an explicit schedule for the single hop request.

38. (currently amended) The system of claim [[35]] 32, wherein the scheduling module at one of the possible source nodes places a denied single hop request on a waiting list.

39. (currently amended) The system of claim [[35]] 32, wherein the scheduling module at one of the possible source nodes suggests an alternative deadline for a denied single hop request.

40. (currently amended) The system of claim [[35]] 32, wherein at least one ~~each~~ single hop request comprises ~~includes~~ an identification of the data and a deadline.

41. (currently amended) The system of claim 2, wherein the transmit bandwidth comprises ~~includes~~ allocated bandwidth and available bandwidth.

42. (currently amended) The system of claim 2, wherein the transmit bandwidth comprises ~~includes~~ allocated bandwidth, available bandwidth, and reserved bandwidth.

43. (currently amended) The system of claim 3, wherein the receive bandwidth comprises ~~includes~~ allocated bandwidth and available bandwidth.

44. (currently amended) The system of claim 3, wherein the receive bandwidth comprises ~~includes~~ allocated bandwidth, available bandwidth, and reserved bandwidth.

45. (currently amended) The system of claim [[15]] 1, wherein the transfer module further comprises ~~includes~~ an execution module configured to execute accepted data transfers under guidance of execution instructions from the scheduling module.

46. (original) The system of claim 45, wherein an execution module at the node configured to receive data responds to dynamic conditions at that node by sending dynamic requests to the node configured to send data.

47. (currently amended) A method for scheduling a data transfer over a communication network, comprising ~~the steps of~~:

configuring a sender to send data;

configuring a receiver to receive the data;

evaluating a request to transfer the data from the sender to the receiver, wherein evaluating the request comprises an evaluation based on resources at the sender and at the receiver, and further comprises evaluating single hop requests for transfers between specific nodes in the communication network, wherein evaluating single hop requests comprises a feasibility test; and

if the request is accepted, scheduling a data transfer according to the request and the resources at the sender and at the receiver.

48. (currently amended) The method of claim 47, wherein ~~the step of~~ configuring a sender comprises ~~includes~~ establishing transmit bandwidth resources.

49. (currently amended) The method of claim 47, wherein ~~the step of~~ configuring a receiver comprises ~~includes~~ establishing receive bandwidth resources and storage space resources.

50. (currently amended) The method of claim 47, further comprising ~~the step of~~ transferring the data from the sender to an intermediary ~~that stores~~ configured to store a copy of the data.

51. (currently amended) The method of claim 50, further comprising ~~the step of~~ transferring the data from the intermediary to the receiver.

52. (currently amended) The method of claim 47, wherein ~~the step of~~ evaluating a request comprises ~~includes~~ considering available transmit bandwidth at the sender, available receive bandwidth at the receiver, and available storage space at the receiver.

53-54. (cancelled)

55. (currently amended) The method of claim [[53]] 47, wherein each single hop request comprises ~~includes~~ an identification of the data and a deadline.

56. (currently amended) The method of claim 47, wherein the resources at the receiver comprise ~~include~~ allocated receive bandwidth and available receive bandwidth.

57. (original) The method of claim 47, wherein the resources at the receiver vary as a function of time.

58. (currently amended) The method of claim 47, wherein the resources at the sender ~~include~~ comprise allocated transmit bandwidth and available transmit bandwidth.

59. (original) The method of claim 47, wherein the resources at the sender vary as a function of time.

60. (original) The method of claim 47, further comprising the step of placing an unaccepted data transfer request on a waiting list.

61. (original) The method of claim 47, further comprising the step of offering an alternative deadline for an unaccepted data transfer request.

62. (currently amended) The method of claim 47, wherein the request to transfer the data ~~includes~~ comprises an earliest deadline for arrival of the data at the receiver, a latest deadline for arrival of the data at the receiver, and a minimum time available during which the data remains available to a user at the receiver.

63. (cancelled)



64. (original) A method for scheduling a data transfer over a network, comprising the steps of:

- identifying a data file and a deadline window for delivery of the data file to a receiver;

- sending the identity of the data file and the deadline window to an admission control module at the receiver, the admission control module being configured to prepare a scheduling request that includes the identity of the data file and a deadline within the deadline window;

- sending the scheduling request to a scheduling module of the receiver;

- querying a routing module at the receiver to identify a possible source node for the data file;

- sending a single hop request from the scheduling module of the receiver to a scheduling module of the possible source node, the single hop request including the identity of the data file and the deadline;

- evaluating the single hop request by the scheduling module at the possible source node, where the single hop request is evaluated in view of the size of the data file, the deadline, and available transmit bandwidth at the possible source node;

- sending a reply to the single hop request to the scheduling module of the receiver indicating whether the single hop request is accepted or denied by the possible source node; and

- if the single hop request is accepted, reserving resources at the receiver, reserving resources at the possible source node, scheduling a time to begin transferring the data file from the possible source node to the receiver, and sending a reply to the scheduling request to the admission control module.

65. (original) The method of claim 64, wherein if the single hop request is denied, the scheduling module of the receiver sends another single hop request to another possible source node identified by the routing module.

66. (original) The method of claim 64, wherein if the single hop request is denied, the reply to the single hop request includes a suggestion for an alternate deadline for delivery of the data file to the receiver.

67-76. (cancelled)